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Original Research Article

Non-Neoplastic Uterine Cervical Lesions - A Histopathologic Evaluation

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Conflict of interest: Nil

Abstract

Background: The uterine cervix is frequently affected by a variety of non-neoplastic lesions, most of which are inflammatory and reactive in nature. Accurate histopathological diagnosis is essential because several benign cervical lesions may clinically and microscopically mimic premalignant or malignant conditions, leading to diagnostic challenges and inappropriate management. This study was designed to evaluate the histopathological spectrum, age distribution, and clinicopathological characteristics of non-neoplastic lesions of the uterine cervix in a tertiary care hospital.

Materials and Methods: This retrospective descriptive study was conducted in the Department of Pathology, Maheshwara Medical College and Hospital, Telangana. A total of 870 cervical specimens received between July 2020 and March 2022 were included. Specimens comprised cervical biopsies, polypectomy specimens, and hysterectomy samples with cervical pathology. Following fixation in 10% neutral buffered formalin, tissues were processed routinely and stained with haematoxylin and eosin. Special stains were employed whenever indicated. Histopathological findings were analyzed according to lesion type, age distribution, and clinical presentation.

Results: Among the 870 non-neoplastic cervical lesions studied, inflammatory lesions constituted the majority of cases. Chronic nonspecific cervicitis was the most common diagnosis, accounting for 55.9% of cases, followed by papillary endocervicitis (20.0%), chronic cervicitis with squamous metaplasia (9.0%), and chronic cervicitis with nabothian cysts (6.0%). The highest incidence was observed in women aged 41-50 years (31.0%), followed by the 31-40years (27.6%). White vaginal discharge was the most common presenting complaint. Rare benign glandular lesions included diffuse laminar endocervical glandular hyperplasia, tunnel clusters, microglandular hyperplasia, and cervical endometriosis.

Conclusion: Non-neoplastic cervical lesions are predominantly inflammatory and occur mainly during the reproductive and perimenopausal periods. Histopathological examination remains the gold standard for accurate diagnosis, enabling differentiation of benign lesions from their malignant mimics and facilitating appropriate patient management.

Keywords: Uterine cervix, non-neoplastic lesions, Chronic cervicitis, Histopathology, Squamous metaplasia.

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Introduction

The uterine cervix represents one of the most frequently examined organs in gynaecological pathology because it is vulnerable to a wide spectrum of inflammatory, reactive, metaplastic, and neoplastic disorders. While considerable attention has been directed toward cervical premalignant and malignant lesions owing to their association with cervical cancer, non-neoplastic cervical lesions constitute a substantial proportion of cervical pathology encountered in routine histopathological practice. These lesions are particularly common among sexually active women and often present with symptoms such as vaginal discharge, abnormal uterine bleeding, pelvic pain, postcoital bleeding, and uterovaginal prolapse. Histopathological evaluation remains the gold standard for definitive diagnosis and accurate characterization of these lesions, thereby facilitating appropriate clinical management and follow-up [1-3]. Non-neoplastic lesions of the cervix are predominantly inflammatory in nature and include chronic nonspecific cervicitis, papillary endocervicitis, follicular cervicitis, nabothian cysts, squamous metaplasia, endocervical polyps, tunnel clusters, microglandular hyperplasia, and endometriosis. Chronic cervicitis is reported as the most common lesion in several histopathological studies and may result from persistent infection, mechanical irritation, trauma, hormonal influences, or chemical exposure. Long-standing inflammation can induce epithelial alterations such as squamous metaplasia and glandular hyperplasia, which

occasionally mimic premalignant or malignant lesions both clinically and microscopically [1,4, 5].

The transformation zone of the cervix is particularly susceptible to chronic inflammatory insults because of continuous exposure to infectious agents and hormonal changes. Histomorphological recognition of benign lesions is therefore essential to avoid overdiagnosis and unnecessary therapeutic interventions. Furthermore, some benign glandular proliferations, including diffuse laminar endocervical glandular hyperplasia and tunnel clusters, may closely resemble adenocarcinoma and require careful pathological assessment [6, 7].

Despite advances in cervical cytology and human papillomavirus (HPV)-based screening, histopathological examination continues to play a pivotal role in establishing definitive diagnoses, especially in patients with persistent symptoms or abnormal screening results. A comprehensive understanding of the histopathological spectrum of non-neoplastic cervical lesions is important for both clinicians and pathologists. Therefore, the present study was undertaken to evaluate the frequency, age distribution, clinical presentation, and histomorphological characteristics of non-neoplastic lesions of the uterine cervix in a tertiary care setting.

Materials and Methods

This retrospective descriptive histopathological study was conducted in the Department of Pathology, Maheshwara Medical College and Hospital, Isnapur, Telangana, India.

The study included cervical specimens received for routine histopathological examination over a period extending from July 2020 to March 2022.A total of 870 cervical specimens obtained from women undergoing gynaecological evaluation and surgical procedures were recruited in the study. The specimens comprised cervical punch biopsies, cervical polypectomy specimens, hysterectomy specimens with cervical pathology, and cervical excisions submitted for histopathological assessment.

Inclusion Criteria

All cervical specimens demonstrating non-neoplastic lesions involving the ectocervix and/or endocervix, specimens with adequate tissue for microscopic evaluation and cases with complete histopathological records and clinical details.

Exclusion Criteria

Inadequate tissue specimens, purely neoplastic lesions of the cervix, lesions originating from the uterine corpus, vagina, vulva, parametrium, or adjacent organs without cervical involvement, and repeat biopsies from previously diagnosed cases.

All specimens were fixed in 10% neutral buffered formalin immediately after receipt. Following gross examination, representative tissue sections were processed through graded alcohol dehydration, xylene clearing, and paraffin embedding. Sections measuring 4-5 µm thickness were prepared using a rotary microtome and stained routinely with haematoxylin and eosin (H&E).Special histochemical stains, including Periodic Acid–Schiff (PAS) and mucicarmine stains, were employed whenever required for confirmation of glandular, mucinous, or metaplastic changes.

Clinical information including age, presenting symptoms, gynaecological history, and provisional diagnosis was obtained from pathology requisition forms and hospital records. Histopathological findings were categorized into inflammatory lesions, metaplastic lesions, glandular hyperplastic lesions, cystic lesions, endocervical polyps, and other benign non-neoplastic conditions. Data were entered into Microsoft Excel and analyzed using SPSS software v.25.0. Descriptive statistics were expressed as frequencies, percentages, means, and standard deviations. Age wise distribution and lesion frequencies were calculated and presented in tabular form.

Results

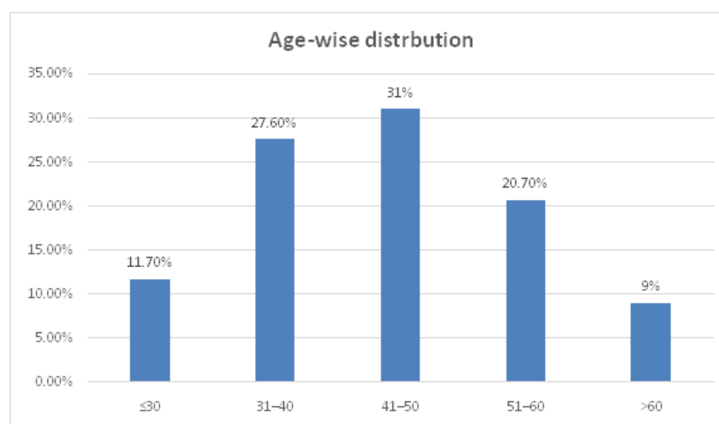

Figure 1: Age wise distribution of study participants(n=870)

Table 1: Histopathological Distribution of Non-Neoplastic Cervical Lesions (n=870)

Histopathological Diagnosis	Frequency	Percentage
Chronic nonspecific cervicitis	486	55.9%
Papillary endocervicitis	174	20%
Chronic cervicitis with squamous metaplasia	78	9%
Chronic cervicitis with nabothian cyst	52	6%
Endocervical polyp	35	4%
Diffuse laminar endocervical glandular hyperplasia	18	2.1%
Tunnel clusters	12	1.4%
Microglandular hyperplasia	10	1.1%
Cervical endometriosis	5	0.5%

Table 2: Clinical Presentation of Patients

Clinical Symptom	Frequency	Percentage
White vaginal discharge	334	38.4%
Abnormal uterine bleeding	236	27.1%
Lower abdominal pain	146	16.8%
Uterovaginal prolapse	99	11.4%
Postmenopausal bleeding	55	6.3%

Table 3: Distribution of inflammatory cervical lesions (n=790)

Inflammatory Lesion	Frequency	Percentage
Chronic nonspecific cervicitis	486	61.5%
Papillary endocervicitis	174	22.0%
Cervicitis with squamous metaplasia	78	9.9%
Cervicitis with nabothian cyst	52	6.6%

Table 4: Age-wise distribution of major cervical lesions

Lesion	≤30	31–40	41–50	51–60	>60	Total
Chronic nonspecific cervicitis	48	138	165	96	39	486
Papillary endocervicitis	24	60	54	27	9	174
Squamous metaplasia	12	24	30	9	3	78
Nabothian cyst	6	15	18	9	4	52
Endocervical polyp	4	10	12	7	2	35

Table 5: Associated histopathological findings

Histopathological Change	Frequency	Percentage
Squamous metaplasia	78	9.0%
Nabothian cyst formation	52	6.0%
Koilocytosis change	24	2.8%
Epidermidization	18	2.1%
Glandular hyperplasia	18	2.1%

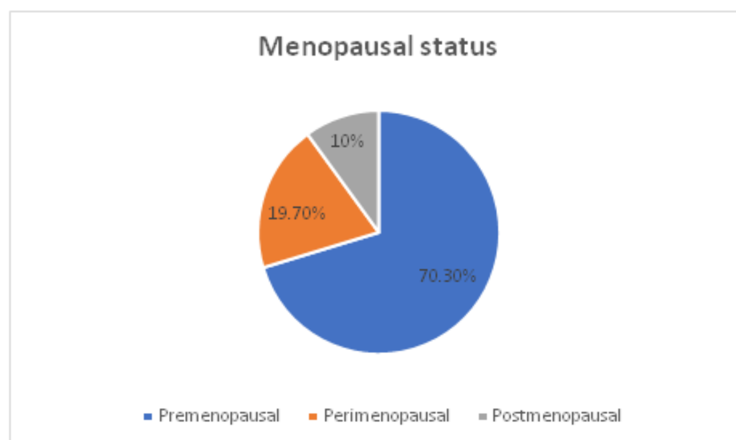

Figure 2: Lesions according to menopausal status

Discussion

The uterine cervix is a dynamic anatomical structure that undergoes continuous physiological and pathological alterations under the influence of hormonal, infectious, and environmental factors. Histopathological examination remains the cornerstone for the diagnosis of cervical lesions, particularly when clinical and cytological findings are inconclusive. In the present study, 870 non-neoplastic cervical lesions were evaluated, providing insight into the histomorphological spectrum and age distribution of benign cervical pathology.

Inflammatory lesions constituted the majority of cases, with chronic nonspecific cervicitis being the predominant diagnosis. Similar findings have been reported by Omoniyi-Esan et al., who observed that chronic cervicitis represented the most frequent cervical lesion in routine histopathological practice, accounting for a substantial proportion of cervical biopsies and hysterectomy specimens [1]. Chronic inflammation of the cervix is commonly attributed to recurrent infections, multiparity, poor genital hygiene, hormonal influences, and mechanical trauma associated with childbirth and instrumentation [2].

In the present study, the highest frequency of lesions was observed in women aged 41-50 years, followed by those aged 31-40 years. This age distribution corresponds to the reproductive and perimenopausal periods during which women are exposed to prolonged hormonal stimulation and increased susceptibility to genital tract infections. Similar age-related trends have been documented by Dass C et al. and Priyadarshini D and Arathi CA et al., who reported the highest incidence of non-neoplastic cervical lesions among women in the fourth and fifth decades of life [4, 8].

Papillary endocervicitis emerged as the second most common lesion in our series. Histologically, these lesions demonstrated papillary infoldings of endocervical mucosa accompanied by chronic inflammatory infiltrates. Persistent cervical inflammation has been shown to induce reactive epithelial changes, glandular hyperplasia, and stromal remodelling, which may occasionally mimic premalignant conditions [9]. Therefore, careful histomorphological assessment is essential to avoid diagnostic pitfalls.

Squamous metaplasia was identified in a significant proportion of cases and was frequently associated with chronic cervicitis. The transformation zone of the cervix is particularly vulnerable to metaplastic changes because of its continuous exposure to acidic vaginal secretions and infectious agents. While squamous metaplasia is considered a physiological reparative response, its recognition is important because immature metaplastic epithelium may resemble cervical intraepithelial neoplasia on microscopic examination [10].

Endocervical polyps are among the most common benign exophytic lesions of the cervix and are generally associated with chronic inflammation and localized stromal proliferation. Previous studies have reported a prevalence ranging from 2% to 5% among gynecological specimens, which is comparable to the findings of the present study [11].

Rare glandular lesions such as tunnel clusters, diffuse laminar endocervical glandular hyperplasia, and microglandular hyperplasia were encountered infrequently. Although benign, these entities are of considerable diagnostic importance because they may simulate adenocarcinoma both clinically and histologically. Nucci emphasized the significance of recognizing tumor-like glandular lesions of the cervix to prevent unnecessary radical surgical interventions [6]. Similarly, microglandular hyperplasia has been recognized as a common diagnostic mimic of well-differentiated adenocarcinoma [7].

The predominance of inflammatory and reactive lesions observed in this study highlights the continuing burden of chronic cervical disease in women attending tertiary care hospitals. Histopathological evaluation not only confirms the benign nature of these lesions but also assists in differentiating them from premalignant and malignant conditions. Enhanced awareness of the diverse morphological patterns of non-neoplastic cervical lesions can facilitate accurate diagnosis, reduce overtreatment, and contribute to improved patient management.

Conclusion

This histopathological evaluation demonstrated that non-neoplastic lesions of the uterine cervix are common and predominantly inflammatory in nature. Chronic nonspecific cervicitis was the most frequent lesion, followed by papillary endocervicitis, squamous metaplasia, and nabothian cysts. Most lesions occurred in women of reproductive and perimenopausal age groups, highlighting the influence of chronic infection, hormonal factors, and reproductive activity. Although uncommon, benign glandular lesions such as tunnel clusters and microglandular hyperplasia require careful recognition because they may mimic malignancy. Histopathological examination remains indispensable for accurate diagnosis, appropriate clinical management, and prevention of unnecessary therapeutic interventions.

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